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TRANSMITTAL FORM

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First Named Inventor	Luc Wuidart
Art Unit	2635
Examiner Name	B. A. Zimmerman
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ENCLOSURES (*Check all that apply*)

- [ ] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [x] Request for Certificate of Correction
- [x] Certificate of Correction
- [x] Columns 14 & 19 of US 7,049,936
- [x] Page 20 of Application as Filed and Page 2 of 08/09/05 Amendment
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
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Remarks

Certificate JUN 08 2006 of Correction

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	WOLF, GREENFIELD & SACKS, P.C.		
Signature			
Printed name	James H. Morris		
Date	May 31, 2006	Reg. No.	34,681

Certificate of Mailing Under 37 CFR 1.8(a)

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Dated: May 31, 2006 Signature: Gail Driscoll (Gail Driscoll)

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PATENT & TRADEMARK OFFICE

Docket No.: S1022.80567US00
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Luc Wuidart		
Serial No.:	09/853891	Patent No.	7,049,936
Filed:	May 11, 2001	Issued:	May 23, 2006
For:	VALIDATION OF THE PRESENCE OF AN ELECTROMAGNETIC TRANSPONDER IN THE FIELD OF A READER		
Examiner:	B. A. Zimmerman		
Art Unit:	2635	Confirmation No.	6160

Certificate of Mailing Under 37 CFR 1.8(a)
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Dated: May 31, 2006

Gail Driscoll
Gail Driscoll

REQUEST FOR CERTIFICATE OF CORRECTION PURSUANT TO 37 CFR 1.322

Attention: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Upon reviewing the above-identified patent, Patentee noted typographical errors which should be corrected.

In the Specification

There is a minor typographical error in each of equations 13 and 14 found in column 14, between lines 55 and 65. The equations are reproduced below as they appear in issued U.S. Patent No. 7,049,936.

$$C1_f = \frac{C1_{off-load}}{1+k_{max}^2}. \qquad (13)$$

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$$Cl_f = \frac{Cl_{off-load}}{1-k_{max}^2}. \tag{14}$$

Equations 13 and 14 as they appear on page 20, lines 20-23 of the application as filed.

$$Cl_f = \frac{Cl_{off-load}}{1+k_{max}{}^2}. \tag{13}$$

$$Cl_f = \frac{Cl_{off-load}}{1-k_{max}{}^2}. \tag{14}$$

In the Claims

In claim 22, column 19, line 19 the word "fields" should be –field—as it appears on page 4 of the amendment filed August 9, 2005.

Patentee respectfully submits that, since the errors for which a Certificate of Correction is sought was the result of Patent Office mistake, no fee is due. However, if the Examiner deems a fee necessary, the fee may be charged to the account of the undersigned, Deposit Account No. 23/2825.

Transmitted herewith is a proposed Certificate of Correction effecting such amendments. Patentee respectfully solicits the granting of the requested Certificate of Correction.

Dated: May 31, 2005

Respectfully submitted,

By: [signature]

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7049936

APPLICATION NO. : 09/853891

ISSUE DATE : May 23, 2006

INVENTOR(S) : Luc Wuidart

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Equations 13 and 14 in column 14 should read:

$$C1_f = \frac{C1_{off-load}}{1 + k_{\max}^{2}}. \quad (13)$$

$$C1_f = \frac{C1_{off-load}}{1 - k_{\max}^{2}}. \quad (14)$$

Claim 22, column 19, line 19 should read:

netic field.

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Accordingly, it is provided to predetermine, in the learning phase, a limiting value X1lim of the imaginary part of the impedance of the terminal's oscillating circuit below which the module must not fall. This value is given by the following relation:

$$X1_{lim} = k_{max}^2 \cdot \omega \cdot L1. \quad (12)$$

Coefficient kmax is, approximately but sufficiently, known for a given family of transponders for which the considered terminal is intended. It generally ranges between approximately 0.1 and 0.4.

As illustrated in Fig. 4B, after having calculated the current imaginary part X1 of the impedance of the terminal's oscillating circuit, its module is compared (block 45) to the module of limiting value $X1_{lim}$.

If the current module is greater than or equal to the limiting module, it may be proceeded as indicated hereabove and the forcing value of relation 10 hereabove is applied (block 46).

If the current module is smaller than the limiting module, it is attempted to determine on which side of the off-load value it is to be found. The ratios of the measured and off-load voltage VC1 and current I are thus measured (block 47). This amounts to determining whether imaginary part X1 is positive or negative.

If the current ratio is greater than the off-load ratio, the following forcing value is applied (block 48):

$$C1_f = \frac{C1_{off-load}}{1 + k_{max}^2}. \quad (13)$$

If the current ratio is smaller than the off-load ratio, the following forcing value is applied (block 49):

$$C1_f = \frac{C1_{off-load}}{1 - k_{max}^2}. \quad (14)$$

Once the capacitance of element 31 has been forced, the initialization process (Fig. 2) proceeds (link 26) based on this new capacitance value.

By applying the example of generally acknowledged values where k_{max} ranges between 0.1 and 0.4, the application of relations 13 and 14 results in choosing, in the first case, a value $C1_f$ ranging between approximately 0.8 and 0.9 times value $C1_{off-load}$ and, in the second case, a value $C1_f$ ranging between approximately 1.1 and 1.2 times value $C1_{off-load}$.

(A) detecting whether a transponder is present in the electromagnetic field by comparing a present value of a parameter corresponding to one or more electrical properties of the oscillating circuit to a predetermined value of the parameter; ~~and~~

(B) if the comparison indicates that a transponder is present in the electromagnetic field, modifying an electrical property of the oscillating circuit in response to the detection; and

(C) determining that a data signal has not been generated by a transponder within the electromagnetic field,

wherein the act (A) is performed in response to the act (C).

13. (Previously Presented) The method of claim 12, wherein (A) comprises detecting that a transponder is in the electromagnetic field by determining that the present value and the predetermined value are different.

14. (Cancelled).

15. (Currently Amended) The method of claim ~~14~~12, wherein (C) comprises performing a first type of modulation that is either phase modulation or amplitude modulation, the method further comprising:

(D) in response to (A) and (C), switching from the first type of modulation to a second type of modulation, wherein the second type of modulation is either phase modulation or amplitude modulation and is a different type than the first type.

16. (Previously Presented) The method of claim 12, wherein (A) comprises detecting a demodulation gap in a detection of data transmitted from a transponder within the electromagnetic field.

17. (Previously Presented) The method of claim 12, wherein the one or more electrical properties include an electrical current in the oscillating circuit and a voltage across the oscillating circuit.

18. (Previously Presented) The method of claim 17, wherein the parameter is a ratio of the voltage to the current.

In the embodiment of FIGS. 3A, 4A, and 5A, capacitance C1 of element **31** of the oscillating circuit is forced (block **42**) to a value C1f equal to the value C1 off-load that it has off-load. This value of the off-load capacitance can easily be stored in the learning phase where the off-load current and voltage have been measured. The initialization process (FIG. 2) carries on (link **26**) based on this new capacitance value.

FIG. 5A illustrates the first embodiment of the method of the present invention by showing three examples of variation amplitudes dI of current I, available for the amplitude demodulator according to capacitance C2 of the transponder present in the terminal's field. In other words, this illustrates the signal available to exploit a back-modulation coming from a transponder by means of the amplitude demodulator.

Variation dI corresponds, as a first approximation, to voltage variation dV across element **31**, and represents the signal to be detected by amplitude demodulator **38**. This is thus a "dynamic" variation (at the rate of the back-modulation remote carrier, for example, 847.5 kHz).

A first curve **50** plotted in full line corresponds to the ideal case where the imaginary part of impedance X1 (formula 3) of the terminal's oscillating circuit is null. This means that the terminal's oscillating circuit is perfectly tuned, including in its dynamic operation. This case is ideal since, given that the reader is provided with a phase loop, which is static with respect to the variations generated by the back-modulation (for example at 847.5 kHz), apparent value X1app is statically null (formula 2). It will be reminded that the essential aim of the static phase loop is to optimize the tuning according to the transponder's load to obtain an optimal remote supply range thereof. Shape **50** forms a sort of bell centered on value $C2_{tun}$ of the capacitance of a transponder perfectly tuned on the remote supply carrier.

With respect to this ideal case, two types of curves can be defined, respectively **51** in stripe-dot lines and **52** in dotted lines corresponding to two real cases where imaginary part X1 of the terminal's oscillating circuit is respectively positive or negative. The case where imaginary part X1 is positive means that the value of capacitance C1 of element **31** is greater than value $C1_{off\text{-}load}$. Conversely, the case where imaginary part X1 is negative corresponds to a value of C1 smaller than $C1_{off\text{-}load}$. In each of curves **51** and **52**, points, respectively **53** and **54**, appear in which the variation of current dI is null. These points correspond to demodulation gaps. It should be noted that curve **50** corresponding to the ideal case also exhibits two zero crossings **55** and **56**, that is, two demodulation gaps. However, points **55** and **56** correspond, in practice, to values of capacitance C2 coming out of the tolerance and drift ranges. Gaps **55** and **56** surround points **53** and **54**.

The implementation of the correction provided by the present invention corresponds to displacing the operating point of the reader to reach the ideal curve (shape **50**). This action is symbolized by a double arrow **57** at the level of point **53** taken as an example. When a demodulation gap is identified, the value of capacitance C1 is forced to its off-load value. The terminal is then pulled out of the demodulation gap, and its demodulator then has enough signal amplitude to read the message sent by the transponder.

According to a specific embodiment, where variable-capacitance capacitive element **31** is formed of a diode or of a transistor, the junction capacitance of which is varied by modifying the voltage applied across its terminals, it can be considered that this control voltage corresponds to voltage VC1. In this case, it is possible to only store, in a learning phase, the value of the off-load capacitance as well as the off-load current. Then, as soon as a demodulation gap is detected, element C1 is biased to a value VC1off-load that is calculated by the following formula:

$$VC1_{off\text{-}load} = \frac{I_{off\text{-}load}}{\omega \cdot C1_{off\text{-}load}}. \tag{9}$$

A second embodiment of the present invention applied to a phase demodulation by the terminal will be described hereafter in relation with FIGS. 3B, 4B, and 5B, which should be compared with FIGS. 3A, 4A, and 5A just described.

FIG. 3B shows an embodiment of a terminal **30** according to the present invention applied to a phase demodulation by said terminal. The difference between the terminal of FIG. 3B and that of FIG. 3A is mainly linked to the demodulator used. In the case of FIG. 3B, a phase demodulator (DEMODP) provides demodulated data signal Rx based on an evaluation of the phase shift at the rate of the back-modulation transmitted by a transponder. According to a preferred embodiment such as illustrated in FIG. 3B, comparator **37** of the phase regulation loop uses the same phase detector as that which is used to demodulate the signal coming from the transponder. Accordingly, signal Rx is provided by comparator **37**. It will however be reminded that the interpretation of the detection result is different. The demodulator takes account of the dynamic variations (at the sub-carrier frequency) while the phase regulator takes static variations into account. As an alternative, two distinct phase detectors may of course be used. The rest of terminal **30** is similar to the structure discussed in relation with FIG. 3A applied to the amplitude demodulation.

FIG. 4B illustrates, by a flowchart, the correction applied according to the present invention to the value of the capacitive element of the terminal in the presence of a phase demodulation gap. Blocks **40** and **41** are similar to those discussed in relation with FIG. 4A. However, in the case of a phase demodulation, forcing the value of capacitance C1 on its off-load value would amount to forcing the tuning of the terminal's oscillating circuit on the carrier frequency. Now, it is then risked to come closer to the demodulation gap centered on the perfect tuning of the oscillating circuits of the terminal and of the transponder.

FIG. 5B shows three examples of shape of the variation dφ of the phase in the terminal's oscillating circuit according to the value taken by capacitance C2 of the transponder's oscillating circuit. FIG. 5B is to be compared with FIG. 5A applied to the amplitude modulation.

A first curve **60** plotted in full line corresponds to the ideal case where the imaginary part of impedance X1 (formula 3) of the terminal's oscillating circuit is null. As previously, this corresponds to the ideal case of a perfect tuning of the terminal.

Shape **60** grows hyperbolically, symmetrically, on either side of a minimum **65** at value $C2_{tun}$ of the capacitance of a transponder perfectly tuned on the remote supply carrier and which, in phase demodulation, corresponds to a demodulation gap.

With respect to this ideal case, two types of curves, respectively **61** in stripe-dot lines and **62** in dotted lines corresponding to two real cases where the imaginary part of the terminal's oscillating circuit is respectively positive or negative. In each of these curves **61** and **62**, points, respectively **63** and **64**, are seen to appear in which phase variation dφ is null. These points correspond to demodulation gaps and surround point **65**. It should be noted that curves **61** and **62** exhibit, each, a second minimum, on the other side of point **65** with respect to their first respective minima **63** and **64**. These second minima are however outside of the tolerance and drift ranges of the transponder components.

Accordingly, they are considered to be impossible in practice. In the example shown, symmetrical positions of minima **63** and **64** with respect to minimum **65** have been considered. This shows that curves **61** and **62** intersect for a value of capacitance C2 which corresponds to tuning value $C2_{tun}$.

It should be noted that, unlike the amplitude demodulation, zero crossing **65** of curve **60** representing the ideal case corresponds to a value of capacitance C2 included in the tolerance and drift ranges.

Three demodulation gaps **63**, **64**, and **65** are thus likely to be present in the response of the phase demodulation. According to the present invention, since it is not desirable to pass on the ideal curve, the correction to be brought differs according to the demodulation gap that is desired to be avoided. Accordingly, when the testing of block **41** gives a negative response, it must still be determined what demodulation gap is involved. For this purpose, the present invention provides a new analysis of the behavior of the oscillating circuits of a terminal and of a transponder to determine, still based on values calculated in a learning phase and on a comparison with current values, the correction to be performed.

It should be reminded that, to avoid affecting the remote supply of the transponder, the correction must, if possible, introduce no static detuning of the terminal's oscillating circuit. Indeed, the beneficial effect of the phase regulation loop on the transponder's remote supply is desired to be preserved. To maintain the remote supply without intervening on the components of the transponder's oscillating circuit, the amplitude of imaginary part X1 of the impedance of the terminal's oscillating circuit must not be modified by the correction. This amounts to maintaining the module of imaginary part X1.

Based on the illustration of FIG. 5B, it is provided according to the present invention to pass onto the symmetrical curve with respect to point **65**, that is, onto the curve representing the imaginary part of opposite sign but of same module. This effect is illustrated, in FIG. 5B, by an arrow **67** illustrating the coming out of gap **63** of curve **61** by shifting on curve **62**.

Based on relation **3** indicated hereabove, this amounts to choosing, for capacitance C1, the following forcing value C1f:

$$C1_f = \frac{1}{\omega \cdot (\omega \cdot L1 + X1)}. \tag{10}$$

Now, the current value of X1 (before correction) is known, either because this value is available at the level of phase regulation circuit **37**, or from the following formula:

$$X1 = \omega \cdot L1 - \frac{VC1}{I}. \tag{11}$$

In the example of FIG. 4B, it is provided to calculate (block **44**) imaginary part X1 based on relation **11** hereabove. It should be noted that all the variables necessary to this calculation are known or measurable (block **40**, FIG. 4B).

However, if minimum **63** is close to minimum **65**, the correction provided hereabove is not sufficient since the amplitude of the useful signal will remain insufficient on the symmetrical curve. In this case, the present invention provides forcing a value of X1 of opposite sign and sufficiently large to move away from the "theoretical" or "ideal" tuning gap **65**. This amounts to passing onto another curve not only having its minimum separated from the current minimum by point **65**, but also having a different value of the apparent impedance. A decrease of the transponder's remote supply must thus here be accepted. It is however attempted to make it a minimal decrease.

It can be shown that the demodulation gap tends towards value $C2_{tun}$ when imaginary part X1 tends towards a value $X1=k2 \cdot \omega \cdot L1$, with k ranging between 0 and kmax, where kmax represents the maximum coupling coefficient between the oscillating circuits of the terminal and of the transponder, that is, the coupling coefficient between these two circuits when their respective antennas L1 and L2 are in a relation of maximum closeness.

Since $\omega \cdot L1$ is an invariant, only the value of k has an influence on that of X1.

Further, since all the adaptations provided by the present invention are intended for being performed in real time and automatically, a forcing value C1f easily determinable by a calculation based on stored and measured values must be provided. To have a sufficient value of X1, the value of k can be forced to kmax to be in the same conditions as those of a transponder at the maximum coupling where it is known to be out of a demodulation gap.

Accordingly, it is provided to predetermine, in the learning phase, a limiting value X1lim of the imaginary part of the impedance of the terminal's oscillating circuit below which the module must not fall. This value is given by the following relation:

$$X1_{lim} k_{max}^2 \cdot \omega \cdot L1. \tag{12}$$

Coefficient kmax is, approximately but sufficiently, known for a given family of transponders for which the considered terminal is intended. It generally ranges between approximately 0.1 and 0.4.

As illustrated in FIG. 4B, after having calculated the current imaginary part X1 of the impedance of the terminal's oscillating circuit, its module is compared (block **45**) to the module of limiting value $X1_{lim}$.

If the current module is greater than or equal to the limiting module, it may be proceeded as indicated hereabove and the forcing value of relation **10** hereabove is applied (block **46**).

If the current module is smaller than the limiting module, it is attempted to determine on which side of the off-load value it is to be found. The ratios of the measured and off-load voltage VC1 and current I are thus measured (block **47**). This amounts to determining whether imaginary part X1 is positive or negative.

If the current ratio is greater than the off-load ratio, the following forcing value is applied (block **48**):

$$C1_f = \frac{C1_{off\text{-}load}}{1 + k_{max}^2}. \tag{13}$$

If the current ratio is smaller than the off-load ratio, the following forcing value is applied (block **49**):

$$C1_f = \frac{C1_{off\text{-}load}}{1 - k_{max}^2}. \tag{14}$$

value to which the imaginary part of the impedance is forced is a function of the position of the imaginary part with respect to a limiting value corresponding to a value measured and stored during an off-load operation of the oscillating circuit, while no transponder was present in the electromagnetic field.

22. An apparatus for controlling an electromagnetic field generated by an oscillating circuit, the apparatus comprising:

a first circuit to detect whether a transponder is present in the electromagnetic field by comparing a present value of a parameter corresponding to one or more electrical properties of the oscillating circuit to a predetermined value of the parameter; and

a second circuit to modify an electrical property of the oscillating circuit in response to the comparison indicating that a transponder is present in the electromagnetic fields,

wherein the comparison indicating that a transponder is present in the electromagnetic field is indicative of detecting a demodulation gap in a detection of data transmitted from the transponder within the electromagnetic field.

23. The apparatus of claim 22, wherein the first circuit comprises means for detecting whether a transponder is present in the electromagnetic field by comparing the present value of the parameter corresponding to the one or more electrical properties of the oscillating circuit to the predetermined value of the parameter.

24. The apparatus of claim 22, wherein the second circuit comprises means for modifying an electrical property of the oscillating circuit in response to the comparison indicating that a transponder is present in the electromagnetic field.

25. The apparatus of claim 22, wherein the first circuit is operative to detect that a transponder is in the electromagnetic field by determining that the present value and the predetermined value are different.

26. The apparatus of claim 22, further comprising:

a first demodulator to determine that a data signal has not been generated by a transponder within the electromagnetic field,

wherein the first circuit is operative to detect whether a transponder is present in the electromagnetic field in response to the determination that a data signal has not been generated by a transponder within the electromagnetic field.

27. The apparatus of claim 26, wherein the first demodulator is operative to perform a first type of modulation that is either amplitude modulation or phase modulation, the apparatus further comprising:

a second demodulator operative to perform a second type of demodulation that is either phase demodulation or amplitude demodulation and is a different type than the first type; and

a selection circuit to select the output of the second demodulator in response to the determination by the first demodulator that a data signal has not been generated by a transponder within the electromagnetic field and the detection that a transponder is present in the electromagnetic field by the first circuit.

28. The apparatus of claim 22, wherein the one or more electrical properties include an electrical current in the oscillating circuit and a voltage across the oscillating circuit.

29. The apparatus of claim 28, wherein the parameter is a ratio of the voltage to the current.

30. The apparatus of claim 22, wherein the oscillating circuit comprises a variable capacitive element, and wherein the second circuit is operative to adjust a value of the variable capacitive element.

31. The apparatus of claim 22, wherein the predetermined value of the parameter was measured and stored during an off-load operation of the oscillating circuit, while no transponder was present in the electromagnetic field.

32. The apparatus of claim 22, further comprising:

a phase regulation circuit to regulate the phase of the oscillating circuit,

wherein the second circuit is operative to deactivate the phase regulation performed by the phase regulation circuit, and to force an imaginary part of an impedance of the oscillating circuit to a predetermined value.

33. The apparatus of claim 32, wherein the oscillating circuit includes a variable capacitive element, and wherein the second circuit is operative to force the imaginary part of the impedance by forcing a value of the variable capacitive element.

34. The apparatus of claim 32, further comprising:

an amplitude modulator, to determine that a data signal has not been generated by a transponder within the electromagnetic field,

wherein the second circuit is operative to force the imaginary part of the impedance to a predetermined value measured and stored during an off-load operation of the oscillating circuit, while no transponder was present in the electromagnetic field.

35. The apparatus of claim 32, further comprising:

a phase demodulator to determine that a data signal has not been generated by a transponder within the electromagnetic field,

wherein the predetermined value to which the imaginary part of the impedance is forced is a function of a position of the imaginary part with respect to a limiting value measured and stored during an off-load operation of the oscillating circuit, while no transponder was present in the electromagnetic field.

36. A method of controlling an electromagnetic field generated by an oscillating circuit, the method comprising:

(A) detecting whether a transponder is present in the electromagnetic field by comparing a present value of a parameter corresponding to one or more electrical properties of the oscillating circuit to a predetermined value of the parameter; and

(B) if the comparison indicates that a transponder is present in the electromagnetic field, modifying an electrical property of the oscillating circuit in response to the detection,

wherein the comparison indicating that a transponder is present in the electromagnetic field is indicative of detecting a demodulation gap in a detection of data transmitted from the transponder within the electromagnetic field.

37. A method of controlling an electromagnetic field generated by an oscillating circuit, the method comprising:

(A) detecting whether a transponder is present in the electromagnetic field by comparing a present value of a parameter corresponding to one or more electrical properties of the oscillating circuit to a predetermined value of the parameter; and

(B) if the comparison indicates that a transponder is present in the electromagnetic field, modifying an electrical property of the oscillating circuit in response to the detection,

wherein the one or more electrical properties include an electrical current in the oscillating circuit and a voltage across the oscillating circuit, and

wherein the parameter is a ratio of the voltage to the current.

38. A method of controlling an electromagnetic field generated by an oscillating circuit, the method comprising:

(A) detecting whether a transponder is present in the electromagnetic field by comparing a present value of a parameter corresponding to one or more electrical properties of the oscillating circuit to a predetermined value of the parameter;

(B) if the comparison indicates that a transponder is present in the electromagnetic field, modifying an electrical property of the oscillating circuit in response to the detection; and

(C) deactivating a phase regulation of the oscillating circuit,

wherein the act (B) comprises forcing an imaginary part of an impedance of the oscillating circuit to a predetermined value.

39. The method of claim 38, wherein the oscillating circuit includes a variable capacitive element,

wherein forcing the imaginary part of the impedance comprises forcing a value of the variable capacitive element.

40. The method of claim 38, further comprising:

(D) performing amplitude demodulation to determine that a data signal has not been generated by a transponder within the electromagnetic field,

wherein (B) includes forcing the imaginary part of the impedance of the oscillating circuit to a predetermined value measured and stored during an off-load operation of the oscillating circuit, while no transponder was present in the electromagnetic field.

41. The method of claim 38, further comprising:

(D) performing phase modulation to determine that a data signal has not been generated by a transponder within the electromagnetic field, wherein the predetermined value to which the imaginary part of the impedance is forced is a function of the position of the imaginary part with respect to a limiting value corresponding to a value measured and stored during an off-load operation of the oscillating circuit, while no transponder was present in the electromagnetic field.

42. An apparatus for controlling an electromagnetic field generated by an oscillating circuit, the apparatus comprising:

a first demodulator to determine that a data signal has not been generated by a transponder within the electromagnetic field;

a first circuit to detect, in response to the determination that a data signal has not been generated by a transponder within the electromagnetic field, whether a transponder is present in the electromagnetic field by comparing a present value of a parameter corresponding to one or more electrical properties of the oscillating circuit to a predetermined value of the parameter; and

a second circuit to modify an electrical property of the oscillating circuit in response to the comparison indicating that a transponder is present in the electromagnetic field.

43. The apparatus of claim 42, wherein the first demodulator is operative to perform a first type of modulation that is either amplitude modulation or phase modulation, the apparatus further comprising:

a second demodulator operative to perform a second type of demodulation that is either phase demodulation or amplitude demodulation and is a different type than the first type; and

a selection circuit to select the output of the second demodulator in response to the determination by the first demodulator that a data signal has not been generated by a transponder within the electromagnetic field and the detection that a transponder is present in the electromagnetic field by the first circuit.

44. An apparatus for controlling an electromagnetic field generated by an oscillating circuit, the apparatus comprising:

a first circuit to detect whether a transponder is present in the electromagnetic field by comparing a present value of a parameter corresponding to one or more electrical properties of the oscillating circuit to a predetermined value of the parameter; and

a second circuit to modify an electrical property of the oscillating circuit in response to the comparison indicating that a transponder is present in the electromagnetic field,

wherein the one or more electrical properties include an electrical current in the oscillating circuit and a voltage across the oscillating circuit, and

wherein the parameter is a ratio of the voltage to the current.

45. An apparatus for controlling an electromagnetic field generated by an oscillating circuit, the apparatus comprising:

a phase regulation circuit to regulate the phase of the oscillating circuit;

a first circuit to detect whether a transponder is present in the electromagnetic field by comparing a present value of a parameter corresponding to one or more electrical properties of the oscillating circuit to a predetermined value of the parameter; and

a second circuit to modify an electrical property of the oscillating circuit in response to the comparison indicating that a transponder is present in the electromagnetic field,

wherein the second circuit is operative to deactivate the phase regulation performed by the phase regulation circuit, and to force an imaginary part of an impedance of the oscillating circuit to a predetermined value.

46. The apparatus of claim 45, wherein the oscillating circuit includes a variable capacitive element, and wherein the second circuit is operative to force the imaginary part of the impedance by forcing a value of the variable capacitive element.

47. The apparatus of claim 45, further comprising:

an amplitude modulator, to determine that a data signal has not been generated by a transponder within the electromagnetic field,

wherein the second circuit is operative to force the imaginary part of the impedance to a predetermined value measured and stored during an off-load operation of the oscillating circuit, while no transponder was present in the electromagnetic field.

48. The apparatus of claim 45, further comprising:

a phase demodulator to determine that a data signal has not been generated by a transponder within the electromagnetic field,

wherein the predetermined value to which the imaginary part of the impedance is forced is a function of a position of the imaginary part with respect to a limiting value measured and stored during an off-load operation of the oscillating circuit, while no transponder was present in the electromagnetic field.

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